

AMENDMENTS TO THE CLAIMS

Claims 1-4 (Cancelled).

Claim 5. (Amended) A method for injection-molding a molded article having a hollow portion by means of an injection-molding apparatus, said apparatus comprising;

(A) a mold assembly having

a first-molten-resin injection portion for injecting a first molten thermoplastic resin into a cavity of the mold assembly,

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a second-molten-resin injection portion for injecting a second molten thermoplastic resin into the cavity of the mold assembly, and

a pressurized-fluid introducing portion for introducing a pressurized fluid into the second molten thermoplastic resin injected into the cavity; and

(B) a first injection cylinder communicating with the first-molten-resin injection portion;

and

a second injection cylinder communicating with the second-molten-resin injection portion;

the said method comprising: ~~the steps of~~;

(a) injecting the first molten thermoplastic resin from the first injection cylinder into the cavity through the first-molten-resin injection portion;

~~(b) initiating the injection of the second molten thermoplastic resin from the second injection cylinder into the cavity through the second-molten-resin injection portion, without bringing the second molten thermoplastic resin into contact with the first molten thermoplastic resin injected into the cavity, concurrently with the start of injection of said injecting the first molten thermoplastic resin into the cavity, during said injecting the first molten thermoplastic resin into the cavity, or after completion of said injecting the first molten thermoplastic resin into the cavity; the injection thereof or after completion of the injection thereof, and~~

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(c) introducing the pressurized fluid into the second molten thermoplastic resin in the cavity from the pressurized-fluid introducing portion during ~~the injection of the second molten thermoplastic resin into the cavity or after completion of the injection thereof, thereby to said injecting the second molten thermoplastic resin into the cavity or after completion of said injecting the second molten thermoplastic resin into the cavity to thereby~~ form the hollow portion inside the second thermoplastic resin.

Claim 6. (Amended) The method according to claim 5, ~~in which~~ wherein the first molten thermoplastic resin comes into contact with the second molten thermoplastic resin in said introducing the pressurized fluid into the second molten thermoplastic resin in the cavity, the first molten thermoplastic resin being in a molten state when the first molten thermoplastic resin comes into contact with the second thermoplastic resin ~~the first thermoplastic resin is in a molten state when the first thermoplastic resin comes in contact with the second molten thermoplastic resin in the step (c).~~

Claim 7. (Amended) The method according to claim 5, ~~in which~~ wherein a portion of the first molten thermoplastic resin ~~which portion comes in contact with the second molten thermoplastic resin in said introducing the pressurized fluid into the second molten thermoplastic resin in the cavity, the portion of the first molten thermoplastic resin coming into~~ comes into a re-melted state due to the contact thereof with the second molten thermoplastic resin ~~in the step~~ (c).

Claim 8. (Amended) A method for injection-molding a molded article having a hollow portion by means of an injection-molding apparatus, said apparatus comprising;

(A) a mold assembly having a first-molten-resin injection portion for injecting a first molten thermoplastic resin into a cavity of the mold assembly, a second-molten-resin injection portion for injecting a second molten thermoplastic resin into the cavity, and a pressurized-fluid introducing portion for introducing a pressurized fluid into the second molten thermoplastic resin injected into the cavity;

(B) a first injection cylinder communicating with the first-molten-resin injection portion, and a second injection cylinder communicating with the second-molten-resin injection portion; and

(C) a movable partition member to be disposed in a portion of the cavity ~~that portion~~ which is between a first cavity portion ~~that~~ in which the first molten thermoplastic resin can occupy in the cavity and a second cavity portion ~~that~~ in which the second molten thermoplastic resin can occupy in the cavity,

the said method comprising: ~~the steps of;~~

(a) disposing the movable partition member in the portion of the cavity ~~that portion~~ which is between the first cavity portion ~~that~~ in which the first molten thermoplastic resin can occupy in the cavity and the second cavity portion ~~that~~ in which the second molten thermoplastic resin can occupy in the cavity;

(b) injecting the first molten thermoplastic resin from the first injection cylinder into the first cavity portion through the first-molten-resin injection portion;

(c) extracting the partition member from the cavity;

(d) injecting the second molten thermoplastic resin into the portion of the cavity ~~that~~ in which the partition member occupied and into the second cavity portion from the second injection cylinder through the second-molten-resin injection portion; and

(e) introducing the pressurized fluid into the second molten thermoplastic resin in the cavity from the pressurized-fluid introducing portion during the injection of the second molten thermoplastic resin or after completion of the injection thereof, ~~thereby~~ to thereby form the hollow portion inside the second thermoplastic resin.

Claim 9. (Amended) The method according to claim 8, in which in ~~the step (c)~~ said extracting said partition member from the cavity, the partition member is extracted from the cavity after the first molten thermoplastic resin is solidified to such an extent that ~~the~~ movement of the partition member does not impair ~~the~~ a form of the first molten thermoplastic resin.

Claim 10. (Amended) The method according to claim 8, in which in ~~the step (d)~~ said injecting the second molten thermoplastic resin, a portion of the first molten thermoplastic resin which portion comes in contact with the second molten thermoplastic resin comes to be in a re-melted state due to its contact ~~to~~ with the second molten thermoplastic resin.

Claim 11. (Amended) The method according to claim 8, in which ~~that~~ a surface of the partition member which is to come in contact with the first molten thermoplastic resin has convexo-concave shapes.

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Claim 12. (Amended) The method according to claim 8, in which ~~the~~ a direction in which the partition member is movable is nearly at right angles with the direction of a pressure exerted on the partition member by the first molten thermoplastic resin injected from the first-molten-resin injection portion into the first cavity portion.

Claim 13. (Amended) A method for injection-molding a molded article having a hollow portion by means of an injection-molding apparatus, said apparatus comprising;

(A) a mold assembly having a first-molten-resin injection portion for injecting a first molten thermoplastic resin into a cavity of the mold assembly, a second-molten-resin injection portion for injecting a second molten thermoplastic resin into the cavity, and a pressurized-fluid introducing portion for introducing a pressurized fluid into the second molten thermoplastic resin injected into the cavity;

(B) a first injection cylinder communicating with the first-molten-resin injection portion;
and

a second injection cylinder communicating with the second-molten-resin injection portion; and

(C) a movable partition member to be disposed in a portion of the cavity ~~that portion~~ which is between a first cavity portion ~~that~~ in which the first molten thermoplastic resin can occupy in the cavity and a second cavity portion ~~that~~ in which the second molten thermoplastic resin can occupy in the cavity;

the said method comprising: ~~the steps of;~~

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(a) disposing the movable partition member in the portion of the cavity ~~that portion~~ which is between the first cavity portion ~~that~~ in which the first molten thermoplastic resin can occupy in the cavity and the second cavity portion ~~that~~ in which the second molten thermoplastic resin can occupy in the cavity;

(b) injecting the second molten thermoplastic resin from the second injection cylinder into the second cavity portion through the second-molten-resin injection portion;

(c) introducing the pressurized fluid into the second molten thermoplastic resin in the second cavity portion from the pressurized-fluid introducing portion during the injection of the second molten thermoplastic resin into the second cavity portion or after completion of the injection thereof, ~~thereby~~ to thereby form the hollow portion inside the second thermoplastic resin;

(d) extracting the partition member from the cavity; and

(e) injecting the first molten thermoplastic resin into the portion of the cavity that in which the partition member occupied and into the first cavity portion from the first injection cylinder through the first-molten-resin injection portion.

Claim 14. (Amended) The method according to claim 13, in which ~~the step (d)~~ said extracting said partition member from the cavity is preceded by discharging of the pressurized fluid from the hollow portion formed inside the second thermoplastic resin.

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Claim 15. (Amended) The method according to claim 13, in which in ~~the step (d)~~ said extracting said partition member from the cavity, the partition member is extracted from the cavity after the second thermoplastic resin is solidified to such an extent that ~~the~~ movement of the partition member does not impair ~~the~~ a form of the second thermoplastic resin.

Claim 16. (Amended) The method according to claim 13, in which in ~~the step (e)~~ said injecting the first molten thermoplastic resin, a portion of the second thermoplastic resin ~~which~~ portion comes in into contact with the first molten thermoplastic resin such that the portion of the second molten thermoplastic resin comes to be in a re-melted state due to its contact ~~to~~ with the first molten thermoplastic resin.

Claim 17. (Amended) The method according to claim 13, in which ~~that~~ a surface of the partition member which is to come in contact with the second molten thermoplastic resin has convexo-concave shapes.

Claim 18. (Amended) The method according to claim 13, in which ~~the~~ a direction in which the partition member is movable is nearly at right angles with the direction of a pressure exerted on the partition member by the second molten thermoplastic resin injected from the second-molten-resin injection portion into the second cavity portion, or at right angles with the direction of a pressure exerted on the partition member by the pressurized fluid introduced from the pressurized-fluid introducing portion.

Claim 19. (New) A method for injection-molding a molded article having a hollow portion, said method comprising:

providing a mold assembly having a cavity disposed between a first molten resin injection portion and a second molten resin injection portion, and a pressurized-fluid introducing portion provided at an opening of the cavity;

injecting a first molten thermoplastic resin from a first injection cylinder into the cavity through the first-molten-resin injection portion;

injecting a second molten thermoplastic resin from a second injection cylinder into the cavity through the second-molten-resin injection portion, without bringing the second molten thermoplastic resin into contact with the first molten thermoplastic resin injected into the cavity,

concurrently with inception of said injecting the first molten thermoplastic resin into the cavity, during said injecting the first molten thermoplastic into the cavity, or after completion of said injecting the first molten thermoplastic into the cavity; and

introducing a pressurized fluid into the second molten thermoplastic resin in the cavity from the pressurized-fluid portion during said injecting a second molten thermoplastic resin into the cavity or after completion of said injecting the second molten thermoplastic resin into the cavity to thereby form the hollow portion inside the second molten thermoplastic resin.

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Claim 20. (New) The method according to claim 19, wherein the first molten thermoplastic resin comes into contact with the second molten thermoplastic resin in said introducing a pressurized fluid into the second molten thermoplastic resin in the cavity, the first molten thermoplastic resin being in a molten state upon coming into contact with the second molten thermoplastic resin.

Claim 21. (New) The method according to claim 19, wherein a portion of the first molten thermoplastic resin comes into contact with the second molten thermoplastic resin in said introducing the pressurized fluid into the second molten thermoplastic resin in the cavity, the portion of the first of the first molten thermoplastic resin coming into a re-melted state due to the contact thereof with the second molten thermoplastic resin.